

CLAIMS

What is claimed is:

1. A scroll compressor comprising:

a first scroll member having a base and a generally spiral wrap extending from said base, and a second scroll member having a base and a generally spiral wrap extending from said base, said wraps of said first and second scroll members interfitting to define compression chambers, and said second scroll member being driven to orbit relative to said first scroll member to compress a refrigerant entrapped in said compression chambers; and

a capacity control which is self-modulating based upon refrigerant conditions, said capacity control including two distinct valves with a first valve moving to a low capacity condition when a pressure differential is below a first predetermined amount, and a second of said valves moving to a low capacity condition when a suction pressure is above a second predetermined amount such that low capacity operation only occurs when said pressure differential is below said first predetermined amount and said suction pressure is above said second predetermined amount.

2. A scroll compressor as recited in Claim 1, wherein said second valve has a first chamber for receiving a suction pressure refrigerant and a spring force, said first chamber biasing said piston towards a second chamber which receives an intermediate refrigerant from a compression chamber, said second valve moving to a position allowing

flow of refrigerant from a compression chamber back to a suction chamber if said suction pressure is above said second predetermined amount.

3. A scroll compressor as recited in Claim 2, wherein said first valve includes a piston which sees a discharge pressure on one face, and a lower pressure along with a spring force on a second face, such that said piston moves to a position blocking flow of refrigerant from a compression chamber to a suction chamber if said pressure differential is above said first predetermined amount.

4. A scroll compressor as recited in Claim 2, wherein said second valve is movable in a valve chamber, and said second valve having two enlarged portions and an intermediate thinner portion, said intermediate thinner portion being aligned with an intermediate pressure dump for dumping refrigerant from an intermediate compression chamber back to a suction pressure chamber when said suction pressure is above said second predetermined amount.

5. A scroll compressor as recited in Claim 1, wherein said first valve includes a piston which sees a discharge pressure on one face, and a lower pressure along with a spring force on a second face, such that said piston moves to a position blocking flow of refrigerant from a compression chamber to a suction chamber if said pressure differential is above said first predetermined amount.

6. A scroll compressor as recited in Claim 1, wherein said scroll compressor is utilized in both a heat pump mode and an air conditioning mode.

7. A scroll compressor comprising:

a first scroll member having a base and a generally spiral wrap extending from said base, and a second scroll member having a base and a generally spiral wrap extending from said base, said wraps of said first and second scroll members interfitting to define compression chambers, and said second scroll member being driven to orbit relative to said first scroll member to compress a refrigerant entrapped in said compression chambers;

capacity control which is self-modulating based upon refrigerant conditions, said capacity control including two distinct valves with a first valve moving to a low capacity condition when a pressure differential is below a first predetermined amount, and a second of said valves moving to a low capacity condition when a suction pressure is above a second predetermined amount such that low capacity operation only occurs when said pressure differential is below said first predetermined amount and said suction pressure is above said second predetermined amount, said second valve has a first chamber for receiving a suction pressure refrigerant and a spring force, said first chamber biasing said piston towards a second chamber which receives an intermediate refrigerant from a compression chamber, said second valve moving to a position allowing flow of refrigerant from a compression chamber back to a suction chamber if said suction pressure is above said second predetermined amount, said first valve includes a piston which sees a discharge pressure on one face, and a lower pressure along with a spring force on a second face, such that said piston moves to a position blocking flow of refrigerant from a compression chamber to a suction chamber if said pressure differential is above said first predetermined amount; and

said scroll compressor being utilized in a heat pump mode as well as an air conditioning mode.

8. A scroll compressor as recited in Claim 7, wherein said second valve is movable in a valve chamber, and said second valve having two enlarged portions and an intermediate thinner portion, said intermediate thinner portion being aligned with an intermediate pressure dump for dumping refrigerant from an intermediate compression chamber back to a suction pressure chamber when said suction pressure is above said second predetermined amount.